
4.4 HYDROLOGY AND WATER QUALITY

4.4 HYDROLOGY AND WATER QUALITY

INTRODUCTION

This section of the EIR describes the existing drainage system in the project area and the surrounding region, and evaluates potential hydrologic and water quality impacts that would result from the approval and buildout of the proposed projects. The impact analysis in this section also addresses issues related to the potential for flooding and changes to existing sedimentation distribution. Information for this chapter is drawn from the City of Rocklin *General Plan EIR* (1991); the *Vista Oaks Preliminary Drainage Report* (Appendix D) prepared by Terrance E. Lowell & Associates, Inc. (TLA) (August 2001)¹ and the *Highland Crown Preliminary Drainage Report* (Appendix E) prepared by TLA (September 2002)². Information pertaining specifically to the proposed bridge over Secret Ravine Creek is drawn from TLA's *Vista Oaks Rocklin EIR Bridge Alternative Storm Impact Analysis* (Appendix F) (April 2004)³; and TLA's *Supplement #1 to Vista Oaks Rocklin EIR Bridge Alternative Storm Impact Analysis* (Appendix G) (July 2004)⁴. Pertinent comments received in response to the Notice of Preparation (NOP) for the proposed projects have been integrated into the analysis.

ENVIRONMENTAL SETTING

The following setting information provides an overview of the existing condition of the drainage systems and sedimentation distribution in the Vista Oaks and Highlands Parcel A project area.

Drainage/Flooding

Vista Oaks and Highlands Parcel A

The project sites are located in the Sacramento River Basin, which encompasses approximately 26,500 square miles and is bounded by the Sierra Nevada to the east, the Coast Range to the west, the Cascade Range and Trinity Mountains to the north, and the Delta-Central Sierra area to the south. The Sacramento River is the principal river in the basin. The principal tributaries to the Sacramento River include the Pit and McCloud Rivers, which join the Sacramento River from the north, and the Feather and American Rivers, which are tributaries from the east. The average runoff from the Basin is estimated to be 21.3 million acre-feet per year.

The project sites are situated within the Secret Ravine Creek watershed, which is a tributary to the Dry Creek Watershed. The Dry Creek Watershed covers approximately 101 square miles in southwestern Placer County and northern Sacramento County. Headwaters of the Dry Creek watershed originate in the Sierra Nevada Foothills near

Newcastle, flow southwesterly into the Sacramento Valley, and empty into the Natomas East Main Drainage Canal, which drains into the Sacramento River, downstream of Sutter County. The Dry Creek watershed bridges the Sierra Nevada and Central Valley geologic provinces and has year-round flows in its major watercourses. In addition to Secret Ravine Creek, the major tributaries to the Dry Creek Watershed in vicinity of the project site are Cirby Creek, Linda Creek, Miner's Ravine, Antelope Creek, and Strap Ravine.

The Placer County Flood Control and Water Conservation District (PCFCWCD) and the Sacramento County Water Agency (SCWA) sponsored the *Dry Creek Watershed Flood Control Plan* ("Flood Control Plan") in April 1992, in order to address concerns within the Dry Creek watershed. The *Flood Control Plan* included information and recommendations for policies necessary to manage the storm waters within the Dry Creek watershed. According to the *Flood Control Plan*, it is anticipated that future land use changes will increase the impervious surface area in the watershed by approximately 50 percent, resulting in increased flood flows. The *Flood Control Plan* also outlined several mitigation strategies including: scheduling construction activities around the rainy season (November 1 to April 15), placing detention basins within the watershed, continuing maintenance of dams and levees, and other measures to avoid erosion, degradation of water quality, and to ensure public safety during flood events.

One of the purposes of the *Flood Control Plan* was to provide flood control management on a regional level by identifying potential locations where detention facilities could be provided within the watershed. Detention reduces the peak discharge by storing and slowly releasing storm water over an extended period of time. According to the reports, onsite detention is required for some areas of the Dry Creek watershed (See Figure 4.4-1). However, the Vista Oaks and Highlands Parcel A project sites are not located in this area, and are therefore not required to have onsite water detention facilities.

The Federal Emergency Management Agency (FEMA) in its most recent Flood Insurance Rate Map (FIRM) has established the designated floodplain along Secret Ravine Creek. The 2001 FIRM published by FEMA for Placer County designates portions of the Vista Oaks and Highlands Parcel A project sites, specifically along Secret Ravine Creek, as within the 100-year floodplain. The 100-year floodplain is used to identify unacceptable safety hazards and indicates the geographic areas having a one-percent chance of being flooded in any given year.

Before any site-specific analysis of flood control, hydrology, and water quality it should be noted that the project sites, particularly within the 100-year floodplain, have historically received heavy disturbance from off-road vehicle use. According to Bob Martin, Traffic Sergeant with the Rocklin Police Department, the sites have experienced constant dirt bike and 4-wheel off-highway vehicle use for at least the past 20 years. However, use has slowed recently due to the increased residential development in surrounding areas and because the Rocklin Police Department is now able to access the site with dirt bikes in order to halt public off-road vehicle use⁵. Various unpaved roads crisscross the area, inhibiting the establishment of vegetation. Some of these roads are in

such close proximity to each other that large tracts of bare ground have been created. Several of these off-road vehicle trails bisect the blue oak woodland habitat on the sites and lead into and out of Secret Ravine Creek.

The Vista Oaks and Highlands drainage reports prepared by TLA identified mitigation for project-related hydrologic impacts and determined that the project, with mitigation, would: 1) only negligibly increase peak downstream or upstream runoff or flood plain areas; 2) be in conformance with the PCFCWCD's *Stormwater Management Plan*, the *Flood Control Plan*, FEMA requirements, and City of Rocklin requirements; 3) provide for areas proposed for development to be above the floodplain; 4) provide for drainage release paths that will allow drainage around proposed projects' structures without encroaching on the finished floor; and 5) provide for BMPs to be included with each development as required.

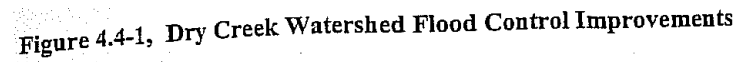
TLA also prepared the *Vista Oaks Rocklin: EIR Bridge Alternative Storm Impact Analysis* ("Bridge Analysis") dated April 27, 2004; the revised *Vista Oaks Rocklin: EIR Bridge Alternative Storm Impact Analysis* ("Revised Bridge Analysis") dated June 6, 2004; and the July 29, 2004 *Supplement #1 to Vista Oaks Rocklin: EIR Bridge Alternative Storm Impact Analysis* ("Supplemental Analysis"). As referenced in the titles of these documents, the proposed bicycle/pedestrian/emergency access bridge over Secret Ravine Creek was considered a project alternative for EIR purposes at that time. The Secret Ravine Creek Bridge is now incorporated into the proposed Vista Oaks project.

The aforementioned documents were based in part on the *Dry Creek Watershed Flood Control Plan*, as well as on consultations with the City of Rocklin and the PCFCWCD. The April 2004 Bridge Analysis evaluated two bridge alternatives, which were located at the same point on Secret Ravine Creek but differed in deck surface elevation and span length. The Revised Bridge Analysis of June 2004 evaluated an additional design alternative ("Alternative C") at the same location. Finally, at PCFCWCD's request, a Supplemental Analysis (July 2004) evaluated the Alternative C design at both the original location and a location 50 feet upstream, this time with a single span blocked by debris. Please refer to the "Impacts and Mitigation Measures" section of this chapter for a more detailed discussion of the bridge analyses.

Water Quality

Surrounding land uses influences water quality in the project areas and throughout the City of Rocklin. The open channels and creeks naturally collect and transport sediment. Much of the area immediately upstream of the project sites is rural in character; however, tributaries of Secret Ravine Creek farther upstream of the project site are more urbanized, and therefore affect the water quality of Secret Ravine Creek in the project area. Possible constituents associated with residential land uses include fertilizers and pesticides, sediments, and to a lesser extent, heavy metals and petroleum hydrocarbons attributed to the use of vehicles.

Figure 4.4-1



REGULATORY CONTEXT

Existing policies, laws and regulations that would apply to the proposed projects are summarized below.

Federal

Federal Emergency Management Agency (FEMA)

The Federal Emergency Management Agency (FEMA) operates the National Flood Insurance Program, which issues maps of Special Flood Hazard Areas (SFHA), based on water surface elevations of the 1 percent (100-year) flood event. For any project that would result in a change to the designated 100-year floodplain, FEMA requires a Letter of Map Revision (LOMR) prior to occupancy or, if the LOMR has not been approved by FEMA, then the project must obtain flood insurance until such LOMR is issued. FEMA issues LOMRs to modify the elevations and/or boundaries of the Special Flood Hazard Areas (based on the 100-year flood event). FEMA requires assurance by the participating community that minimum floodplain management requirements are complied with, including minimum floor elevations above the “base flood,” existing lands and structures or proposed structures are “reasonably safe from flooding,” and that all supporting analysis and documentation used to make that determination is on file and available upon request.

National Pollutant Discharge Elimination System (NPDES)

As authorized by the Clean Water Act (CWA), the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. Construction sites are typically considered to be point sources of pollution.

Non-point sources diffuse and originate over a wide area rather than from a definable point. Non-point pollution often enters receiving water in the form of surface runoff and is not conveyed by way of pipelines or discrete conveyances. As defined in the federal regulations, such non-point sources are generally exempt from federal NPDES permit program requirements. However, two types of non-point source discharges are controlled by the NPDES program: 1) non-point source discharges caused by general construction activities and 2) the general quality of storm water in municipal storm water systems (either as part of a combined system or as a separate system in which runoff is carried through a developed conveyance system to specific discharge locations). The 1987 amendments to the CWA directed the federal EPA to implement the storm water program in two phases. Phase I addressed discharges from large (population 250,000 or above) and medium (population 100,000 to 250,000) communities with Municipal Separate Storm Sewer Systems (MS4s). On December 8, 1999, the EPA promulgated the Phase II Regulations covering small MS4s. The City of Rocklin is automatically included as a small MS4 because it is located within an urbanized area. The Phase II Regulations issued by EPA are administered within California by the State Water Resources Control

Board (SWRCB). The federal regulations allow two permitting options for storm water discharge: individual permits and general permits. The SWRCB has elected to adopt a statewide General Permit for small MS4s. These options allow small MS4s to sign onto the General Permit in lieu of developing a fully individualized program and allow the State to efficiently regulate numerous storm water dischargers under a single permit. The City of Rocklin has opted to comply with the Phase II regulations through coverage under the State's General Permit.

The goal of the NPDES non-point source regulations is to improve the quality of storm water discharged to receiving waters to the "maximum extent practicable" through the use of Best Management Practices (BMPs) and Best Available Technologies (BATs). BMPs/BATs can include the development and implementation of various practices including educational measures (workshops informing public of what impacts results when household chemicals are dumped into storm drains), regulatory measures (local authority of drainage facility design), public policy measures (label storm drain inlets as to impacts of dumping on receiving waters) and structural measures (filter strips, grass swales and detention ponds).

Construction Site Runoff Management

In accordance with NPDES regulations, to minimize the potential effects of construction runoff on receiving water quality, the State requires that any construction activity affecting one acre or more must obtain a General Construction Activity Storm Water Permit. Permit applications are required in order to prepare Storm Water Pollution Prevention Plans (SWPPP) and implement source control BMPs to reduce construction effects on receiving water quality by implementing erosion control measures. Because construction of the proposed projects would disturb more than one acre, the project would be subject to permit requirements. In addition, 1997 revisions to the original 1992 general permit clarified that all construction activity, including small construction sites (one to five acres) and sites under five acres that are a part of a larger common plan, must obtain a General Permit. The SWRCB adopted a revised General Permit in August 1999.

Examples of typical construction BMPs completed in SWPPPs include: using temporary mulching, seeding, or other suitable stabilization measures to protect uncovered soils; storing materials and equipment to ensure that spills or leaks cannot enter the storm drain system or surface water; developing and implementing a spill prevention and cleanup plan; installing traps, filters, or other devices at drop inlets to prevent contaminants from entering storm drains; and using barriers, such as straw wattles or plastic, to minimize the amount of uncontrolled runoff that could enter drains or surface water. The discharger must also install structural controls, such as sediment control, as necessary, which will constitute Best Available Technologies to achieve compliance with water quality standards.

Urban Runoff Management

The City of Rocklin has opted to comply with the Phase II regulations through coverage under the State's General Permit. The Phase II General Permit contains four basin requirements: discharge prohibition, effluent limitations, storm water management program requirements, and reporting requirements.

The General Permit prohibits discharges of waste that are otherwise prohibited under State and regional water quality control plans. In addition, the General Permit prohibits discharges that cause or threaten to cause a nuisance, discharges that contain a reportable quantity of specified hazardous substances, and any other discharge except as allowed under the NPDES permit.

The General Permit requires permittees to reduce pollutants in storm water. To satisfy this requirement, the small MS4s, such as the City of Rocklin, must develop and implement a storm water management program (SWMP) designed to reduce the discharge of pollutants through the storm drain to the Maximum Extent Practicable (MEP) to protect water quality. A MS4 can satisfy this requirement through effective implementation of a SWMP. The MEP standard is a technology-based standard and is acceptable in lieu of numeric effluent limitations. The MEP is an ever-evolving, flexible, and advancing concept, which considers technical and economic feasibility. As knowledge about control and urban runoff continues to evolve, so do the concepts which define "MEP."

The City of Rocklin's current SWMP, dated September 2003, has been prepared to satisfy the requirements of the General Permit. The SWMP describes how pollutants in storm water will be controlled by means of BMPs that address six (6) minimum control measures (MCM) specified in the General Permit. These six MCMs are as follows:

1. Public education and outreach;
2. Public participation;
3. Illicit discharge detection and elimination;
4. Construction site storm water runoff control;
5. Post-Construction storm water management; and
6. Pollution preventing/good housekeeping for municipal operations.

Each BMP has specified measurable goals and a timetable for implementation to help measure program effectiveness.

Attachment 4 of the City's NPDES permit (Appendix H of this Draft EIR) states that the City must comply with the presented receiving water limitations and design standards. The receiving water limitations state that discharges shall not cause or contribute to an exceedance of water quality standards and that permittees shall comply through timely implementation of control measures and other actions to reduce discharge of pollutants. The design standards require Regulated Small MS4s to adopt an ordinance or other document to ensure implementation of the Design Standards (the SWMP discussed

above). All discretionary development and redevelopment projects that fall into one of the following categories are subject to the Design Standards:

- Single-Family Hillside Residences;
- 100,000 Square Foot Commercial Developments;
- Automotive Repair Shops;
- Retail Gasoline Outlets;
- Restaurants; and
- Home Subdivisions with 10 or more parking spaces and potentially exposed to storm water runoff.

Compliance with Attachment 4 will at a minimum require the following during construction activities:

Non-hazardous materials management

- Store sand, dirt, and similar materials off the street, at least 10 feet from catch basins, and covered with a tarp during wet weather or when rain is forecast.
- Water daily for dust control and as needed.
- Sweep streets and other paved areas daily.
- Recycle all asphalt, concrete, and aggregate base material from demolition activities.
- Check dumpsters regularly for leaks and to make sure they don't overflow. Repair or replace leaking dumpsters promptly.

Hazardous materials management

- Label all hazardous materials and hazardous wastes (such as pesticides, paints, thinners, solvents, fuel, oil, and antifreeze) in accordance with city, state, and federal regulations.
- Store hazardous materials and wastes in secondary containment and cover them during wet weather.
- Follow manufacturer's application instructions for hazardous materials and use no more than necessary.
- Appropriately dispose of all hazardous wastes in accordance with city, state, and federal regulations.

Spill prevention and control

- Keep a stockpile of spill cleanup materials (rags, absorbents, etc.) available at the construction site at all times.
- When spills or leaks occur, contain them immediately and be particularly careful to prevent leaks and spills from reaching the gutter, street, or storm drain. Do not wash spilled material into a gutter, street, storm drain, or creek.

Vehicle and Equipment Maintenance & Cleaning

- Inspect vehicles and equipment for leaks frequently; use drip pans to catch leaks until repairs are made; repair leaks promptly.
- Fuel and maintain vehicles on site only in a bermed area or over a drip pan that is big enough to prevent runoff.
- Avoid cleaning vehicles and equipment on site.
- If cleaning is necessary, clean with water only in a bermed area that will not allow rinse water to run into gutters, streets, storm drains, or creeks.
- Vehicle or equipment cleaning on site using soaps, solvents, degreasers, steam cleaning equipment, etc. is prohibited.

Earthwork & Contaminated Soils

- Retain excavated soil on the site where it is least likely to collect in the street. Transfer to dump trucks should take place on the site, not in the street.
- Use fiber rolls, silt fences, or other control measures to minimize the flow of silt off the site.
- Avoid scheduling earth moving activities during the rainy season if possible. If grading activities during wet weather are necessary, implement measures to prevent erosion.
- Mature vegetation is the best form of erosion control. Minimize disturbance to existing vegetation whenever possible.

Saw Cutting

- Completely cover or barricade storm drain inlets when saw cutting
- Use filter fabric, sand bags, or fine gravel dams to keep slurry out of the storm drain system.
- Shovel, absorb, or vacuum saw-cut slurry and pick up all waste as soon as you are finished in one location or at the end of each work day (whichever is sooner.)

Paving / Asphalt Work

- Always cover storm drain inlets and manholes when paving or applying seal coat, tack coat, slurry seal, or fog seal.
- Place drip pans or absorbent material under paving equipment when not in use.
- Protect gutters, ditches, and drainage courses with gravel dams, sand bags, or earthen berms
- Do not sweep or wash down excess sand from sand sealing into gutters, storm drains, or creeks. Collect sand and return it to the stockpile, or dispose of it as trash.
- Do not use water to wash down fresh asphalt concrete pavement.

Concrete, Grout, and Mortar Storage & Waste Disposal

- Store concrete, grout, and mortar under cover and away from drainage areas.
- Wash out concrete equipment and trucks off-site or designate an on-site area for washing where water will flow into a temporary pit. Let the water evaporate, or collect the wash water and remove it for appropriate disposal off-site, then dispose of hardened concrete with trash.
- Divert water from washing exposed aggregate concrete to a dirt area where it will not run into a gutter, street or storm drain. If a suitable dirt area is not available, collect and filter the wash water through a gravel dam before discharging to a storm drain.

Painting

- Never rinse paint brushes or materials in a gutter or street.
- Paint out excess water-based paint before rinsing brushes, rollers, or containers in a sink.
- Paint out excess oil-based paint before cleaning brushes in thinner.
- Filter paint thinners and solvents for reuse whenever possible.
- Dispose of oil-based paint sludge and unusable thinner as hazardous waste in accordance with city, state, and federal regulations.

Construction Dewatering

Clean or relatively pollutant-free wastewater that poses little or no threat to water quality may be discharged directly to surface water under certain conditions. In addition to the State General Construction Activity Permit, the Central Valley Regional Water Quality Control Board (CVRWQCB) has also adopted a general NPDES permit for short-term discharges of small volumes of wastewater from certain construction-related activities. Permit conditions for the discharges of these types of wastewaters to surface water are specified in Waste Discharge Requirements (WDR), “General Order for Dewatering and Other Low-Threat Discharges to Surface Waters.” Discharges may be covered by the permit, provided they are (1) either four months or less in duration, or (2) the average dry weather discharge does not exceed 0.25 million gallons per day. Construction dewatering, well development water, pump/well testing, and miscellaneous dewatering/low-threat discharges are among the types of discharges that may be covered by the permit. The general permit also specifies standards for testing, monitoring, reporting, receiving water limitations, and discharge prohibitions.

State

State of California Reclamation Board

The Reclamation Board controls flooding along the Sacramento and San Joaquin Rivers and their tributaries in cooperation with the U.S. Army Corps of Engineers; cooperates

with various agencies of the federal, State, and local governments in establishing, planning, constructing, operating, and maintaining flood control works; and maintains the integrity of the existing flood control system and designated floodways through the Board's regulatory authority by issuing permits for encroachments. The California Code of Regulations, Title 23, Waters, Article 3, requires that a Board permit be obtained before the start of any work, including excavation and construction activities, where the Reclamation Board has jurisdiction.

Local

Placer County Flood Control and Water Conservation District (PCFCWCD)

The Placer County Flood Control and Water Conservation District (PCFCWCD) was established in 1984 by the State Legislature as a special district, separate from county government, to address flood control issues arising from growth in the area. The PCFCWCD boundaries are the same as the Placer County boundaries. The main purpose of PCFCWCD is to protect lives and property from the effects of flooding through comprehensive and coordinated flood prevention planning, using consistent standards to evaluate flood risk, and by implementing flood control measures, such as requiring new development to construct detention basins, and operation and management of a flood warning system.

The Nonstructural Policy Recommendations contained in the *Dry Creek Watershed Flood Control Plan* include that local detention does not need to be provided by development located in the southwestern reaches of the Dry Creek watershed. The *Dry Creek Plan* found that local detention caused no net decreases in regional flood flows, and therefore, local detention is not required.

City of Rocklin General Plan

The following are existing policies, laws, and regulations established in the 1991 *City of Rocklin General Plan*, as applicable to the proposed Vista Oaks and Highlands Parcel A project:

Open Space, Conservation, and Recreation Element⁶

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| Policy 6 | To cooperate in a coordinated regional approach to the management of drainage basins and flood plains with regional agencies such as the Placer County Flood Control and Water Conservation District (PCFCWCD). |
| Policy 19 | To minimize the degradation of water quality through requiring implementation of techniques such as, but not limited to, the prohibition of grading, placement of fill or trash or alteration to vegetation within designated stream setback buffer areas, and requiring the installation of measures which minimize runoff waters containing pollutants and sediments entering surface water. Measures for minimizing pollutants and sediments entering watercourses may include oil/grit separators, detention basins and flow reduction devices. |

Community Safety Element⁷

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| Policy 2 | To cooperate with and support the formation of a coordinated city-wide and/or regional approach for the construction, operation, and maintenance of drainage and flood control facilities. |
| Policy 3 | To require master drainage plans as a condition of approval for large development projects. |
| Policy 4 | To require new residential construction to have its lowest habitable floor elevated at least two feet (2') above the base flood level elevation (i.e., the 100-year floodplain elevation). |
| Policy 5 | To ensure that 100-year floodplain elevations, based upon the most current information, both up and downstream are not adversely affected by new development. |
| Policy 6 | To require new developments to detain on-site drainage such that the rate of runoff flow is maintained at pre-development levels and to coordinate with other projects' master plans to ensure no adverse cumulative effects. In lieu of detention, the City may require off-site drainage improvements that are more beneficial to the community's overall drainage system. |

Southeast Rocklin Circulation Element

The following Southeast Rocklin Circulation Element policies are applicable to the hydrology, water quality, and flooding issues associated with the proposed projects:

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| Policy 19 | Design road improvements and new alignments to limit the number of creek crossings and minimize adverse impacts to existing wildlife habitats. |
| Policy 31 | Hydroseed areas adjacent to finished roadbeds that were disturbed during construction to promote revegetation and reduce erosion potential. |
| Policy 32 | Develop a revegetation plan (in consultation with the Department of Fish and Game) to compensate for riparian acreage eliminated by creek crossing construction. This plan will be implemented by a qualified revegetation contractor. |
| Policy 33 | Photograph streambed and bank contours prior to construction. These photographs shall be kept on file at the Rocklin Community Development Department. Following construction, restore creekbed and bank contours as near as possible, to pre-project conditions. |
| Policy 34 | Set aside topsoil removed by grading prior to road construction for later use in revegetation and recontouring efforts. |
| Policy 35 | Develop and implement a plan, in consultation with the Department of Fish and Game, to remove instream obstacles to salmon and steelhead migration in stream crossing areas. |
| Policy 36 | Develop a monitoring program to ensure the Southeast Rocklin Circulation Element policies are properly implemented and complied with. City monitoring will be conducted by the City Engineer, Community Development Director, and the City Public Works Field Inspector in consultation with a qualified biologist when needed. |

City of Rocklin Zoning Ordinance

Chapter 8.30 – Stormwater Runoff Pollution Control Ordinance

This ordinance prohibits the discharge of any materials or pollutants that cause or contribute to a violation of applicable water quality standards, other than stormwater, into

the municipal storm drain system or watercourses. Examples of materials that are not prohibited under this ordinance include the following:

- Motor oil
- Yard waste
- Animal waste
- Grease and oil from restaurants
- Commercial carpet cleaning waste
- Concrete washout
- Paint and associated equipment cleaning

Chapter 15.28 – Grading and Erosion and Sedimentation Control

The City's grading and erosion and sediment control ordinance requires that all grading in the City, unless exempt under the ordinance, must have a grading approval and provides for a separate grading permit. Plan check and issuance of grading permits is done by the Engineering Services Division and approved by the Engineering Services Manager, who is the designated City Engineer. The grading permit process is divided into a minor plan approval for smaller low impact jobs and a considerably more complex engineered grading plan approval for bigger jobs. The grading permit is a staff-level discretionary decision and more comprehensive CEQA environmental review is required for some applications.

IMPACTS AND MITIGATION MEASURES

The impacts to hydrology and water quality regarding the proposed projects are analyzed and assessed in this section.

Standards of Significance

A hydrology/water quality impact would be considered significant if implementation of the proposed project would:

- Violate water quality standards or waste discharge requirements or substantially degrade water quality; or;
- Substantially alter the existing drainage pattern in a manner that would either result in substantial erosion or siltation on- or off-site, or increase the rate or amount of surface runoff resulting in flooding on- or off-site; or;
- Create or contribute runoff that would exceed the capacity of existing or planned stormwater drainage systems; or;
- Expose people or structures to increased risk of flooding by placing structures within a 100-year floodplain, mapped on a federal FIRM map or other flood hazard delineation map; or;
- Expose people or structures to risk of flooding by locating structures where they could impede or redirect flood flows.

Method of Analysis

The hydrology and water quality impact analysis of the proposed Vista Oaks and Highlands Parcel A subdivisions is based primarily on TLA's *Vista Oaks Preliminary Drainage Report* ("Vista Oaks report," August 3, 2001) and *Highland Crown Preliminary Drainage Report* ("Highlands report," September 9, 2002). It should be noted that the Vista Oaks report evaluated not only the present City of Rocklin Vista Oaks project site as evaluated in this Draft EIR, but the portion of the Vista Oaks project located within the City of Roseville as well. The documents were based in part on the PCFCWCD *Stormwater Management Manual*; the FEMA Flood Insurance Study for Placer County dated June 8, 1998; the PCFCWCD *Final Report Dry Creek Watershed Flood Control Plan*; and 1984 excerpts from FEMA plans for the Cities of Rocklin and Roseville.

Analysis of the proposed bicycle/pedestrian/emergency access bridge over Secret Ravine Creek is based on TLA's *Vista Oaks Rocklin: EIR Bridge Alternative Storm Impact Analysis* ("Bridge Analysis") dated April 27, 2004; the revised *Vista Oaks Rocklin: EIR Bridge Alternative Storm Impact Analysis* ("Revised Bridge Analysis") dated June 6, 2004; and the July 29, 2004 *Supplement #1 to Vista Oaks Rocklin: EIR Bridge Alternative Storm Impact Analysis* ("Supplemental Analysis"). The latter three documents were based in part on the PCFCWCD *Dry Creek Watershed Flood Control Plan*, as well as on consultations with the City of Rocklin and PCFCWCD personnel.

Project-Specific Impacts and Mitigation Measures

4.4I-1 Impacts related to change in peak stormwater flows.

Vista Oaks and Highlands Parcel A

The Vista Oaks and Highlands Parcel A project sites are primarily undeveloped and contain few artificial impervious surfaces. Development of the proposed projects would increase the amount of impervious surfaces through the construction of residences and roadways. Consequently, there would be an increase in the rate and volume of storm water runoff.

The project sites encompass eight natural drainage basins. Five basins serve the eastern portion of the project sites, one of which lies almost entirely within the project site boundaries. However, only a small percentage of the other four eastern basins are included within the site, the rest residing outside the projects boundaries. The remaining three basins located in the western portion of the Vista Oaks site are predominantly within the project boundary. All eight drainage basins currently outfall into Secret Ravine Creek.

The effects of the proposed developments on peak stormwater flows were evaluated using a rainfall-runoff computer model known as HEC-1. Engineers at Terrance Lowell and Associates, Inc. evaluated stormwater runoff from the

proposed projects by comparing existing known runoff conditions to projected conditions potentially resulting from the proposed developments. The projected conditions are a result of the HEC-1 stormwater runoff model run. The results of the model runs are presented by Terrance Lowell and Associates in a series of drainage reports for the Vista Oaks and Highland Crown developments (Highland Crown includes Highlands Parcel A). These reports, which were the subject of an independent review by the EIR consultant, are part of the technical appendices for this document and are also available for further review at the City of Rocklin Planning Department.

The analyses conducted for the proposed projects indicates that after project buildout, approximately 34.7 percent of the Vista Oaks project site and 24.1 percent of the Highlands Parcel A project site would consist of impervious surfaces. The analyses further indicate that the impervious surfaces would result in additional runoff, the effect of which would increase the water surface elevation of Secret Ravine Creek during the peak of a 100-year storm event by 0.0007 feet. This number might be best expressed as 0.21 millimeters or 1/128th of an inch. This analysis makes the conservative assumption that the peak stormwater flow from the respective project sites would occur at the same time as the peak flow arriving near the project sites from the entire upstream Secret Ravine drainage basin. This event is unlikely if not impossible as the projects' peak flows will runoff long before the peak flow arrives from the upstream Secret Ravine watershed.

Because the proposed projects would not result in a significant increase to water surface elevations (the 1/128th of an inch increase in peak water surface elevation indicated by the model is considered negligible), stormwater and flood-carrying facilities would neither be overloaded nor impacted by the proposed projects. Incremental measurable effects due to proposed land use changes would not occur.

Even if the incremental effects of the project were so great as to be deemed substantial the project sites are located in an area where additional detention facilities are specifically not recommended by the *Dry Creek Watershed Flood Control Plan*. That plan states that detention facilities could aggravate downstream flows in Secret Ravine. Exhibit "D" of the Placer County Flood Control and Water Conservation District's Resolution No: R1001, and figure 5-2 of the April 1992 *Dry Creek Watershed Flood Control Plan* designate areas where detention facilities are not required because of the potential for adversely increasing downstream peak flows.

The City's development review process will require the applicant to prepare a Final Master Drainage Plan for City review and approval prior to final map approval. For this reason, and because the proposed projects would not substantially increase the rate or amount of surface runoff resulting in flooding, nor contribute runoff in excess of the capacity of existing or planned

stormwater drainage systems, the project is not anticipated to alter the existing drainage pattern in a manner that would result in substantial on-or off-site erosion or siltation.

The change in peak stormwater flows resulting from implementation of the proposed projects would be considered *less-than-significant* because of the following findings:

- the proposed projects would not substantially increase the rate or amount of surface runoff resulting in flooding on- or off-site;
- the proposed projects would not create or contribute runoff that would exceed the capacity of existing or planned stormwater drainage systems; and
- the project would be required to prepare a final master drainage plan prior to final map approval.

Mitigation Measures(s)

None required.

4.4I-2 Exposure of future and adjacent residents to hazards associated with a 100-year flood event.

Upland Construction in Vista Oaks and Highlands Parcel A

On the Vista Oaks and Highlands Parcel A project sites, the FEMA 100-year floodplain (see Figure 4.4-2) is generally limited to the area within a plus 10-foot elevation gain from the bed of Secret Ravine Creek and which extends less than 50 feet from the centerline of the creek.

The tentative maps for the proposed projects (See Figure 4.4-3, 4.4-4, and 4.4-5) indicate that all residential parcels are located outside the existing 100-year floodplain. The project applicants propose to set aside all of the Secret Ravine Creek 100-year floodplain existing within the project site as permanent open space. The development of the proposed projects would not place housing in a manner that would impede or redirect flows within a 100-year flood hazard area. However, the project proposes to place a bridge within the 100-year floodplain. As stated below, the installation of the bridge structure would not significantly increase the extent of the 100-year floodplain.